

Magnetotelluric investigation of the Denizli graben in the Western Anatolian Extensional Province

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The Eastern Mediterranean region is known as a natural laboratory for earthsciences due to having tracks of opening and closing oceans (northern and southern tethys), subduction, obduction phenomena in palaeotectonic era, and having active subduction, collision, and related tectonic structures in Neotectonic period. The most important structure of the region is Africa and Eurasia convergence which was a single subduction zone in east-west trending but it has been evolving into different tectonic parts through the geological time. One of the most significant of these tectonic fragments in the neotectonic period is called as Eastern Aegean arc which has a 40 mm/year subduction rate with high dip angle beneath Aegean sea – Western Anatolia, and also migration in the south-southwestward direction give rise to retreating of the slab. Furthermore, recent tomographic studies indicate that intersection area of the Aegean and Cyprus arc (just east of Aegean arc) which located beneath the Western Anatolia is defined as a slab tear that causes asthenospheric upwelling in SW Anatolia. Therefore, an extensional regime, accompanied with volcanism, has been well established in Western Anatolia. And currently the region is dominated by horst graben systems and associated boundary faults. The aforementioned tectonic conditions which make the Western Anatolian graben systems candidates as geothermal potential regions. Since it provides the environment where three necessary components (heat Source, a reservoir with high porosity and permeability, liquid cycle system) of a geothermal system can be found. Thus it becomes important to reveal the structure of the graben systems. Magnetotelluric data were collected at 305 stations over a frequency range of 10,000 Hz to 0.001 Hz in Denizli graben-horst systems located in Western Anatolian Extensional Province. 3D MT inversions were performed to image the resistivity structure of the region.